1998

South Central Nebraska Geology Field Trip Conservation and Survey Division-IANR-UNL & Nebraska Well Drillers Association

Conservation Survey Division
University of Nebraska - Lincoln

SOUTH CENTRAL NEBRASKA GEOLOGY FIELD TRIP
CONSERVATION AND SURVEY DIVISION-IANR-UNL &
NEBRASKA WELL DRILLERS ASSOCIATION
OCTOBER 1, 1998

7:00 - 7:25 am Register at the Tri-Basin NRD at 1308 2nd St. in Holdrege, Nebraska Load Vans at 7:25 am. and leave at 7:30 am. Drive to Sacramento-Wilcox State Wildlife Management Area. Arrive at 7:50 - Observe and talk about the soils, topography and importance of rain basins to the groundwater. Francis Belohlavy-Conservation & Survey Div. IANR, Univ. Nebr. Lincoln. Depart at 8:45 am.

8:45 - 9:30 am Drive to Niobrara Chalkrock outcrop near Bloomington. A) Talk about the geology of the area and Educational Circular # 7 on the Geology in Franklin County, Nebraska. Roger Pabian CSD- UNL. Coffee will be served at this site. B) Observe and discuss the Kahrs pump test site in the Republican River Valley just below this site. Discussion will also be made on the 4 other Republican River pump test sites. Jim Goeke, Mohan Khisty and Scott Summerside - Conservation and Survey. Depart at 11:10 am.

11:10 - 11:25 am Drive to Naponee, Nebraska site. This site was drilled and the samples were dated. The soils and geology will be discussed. CSD Staff. Depart at 12:00 pm.

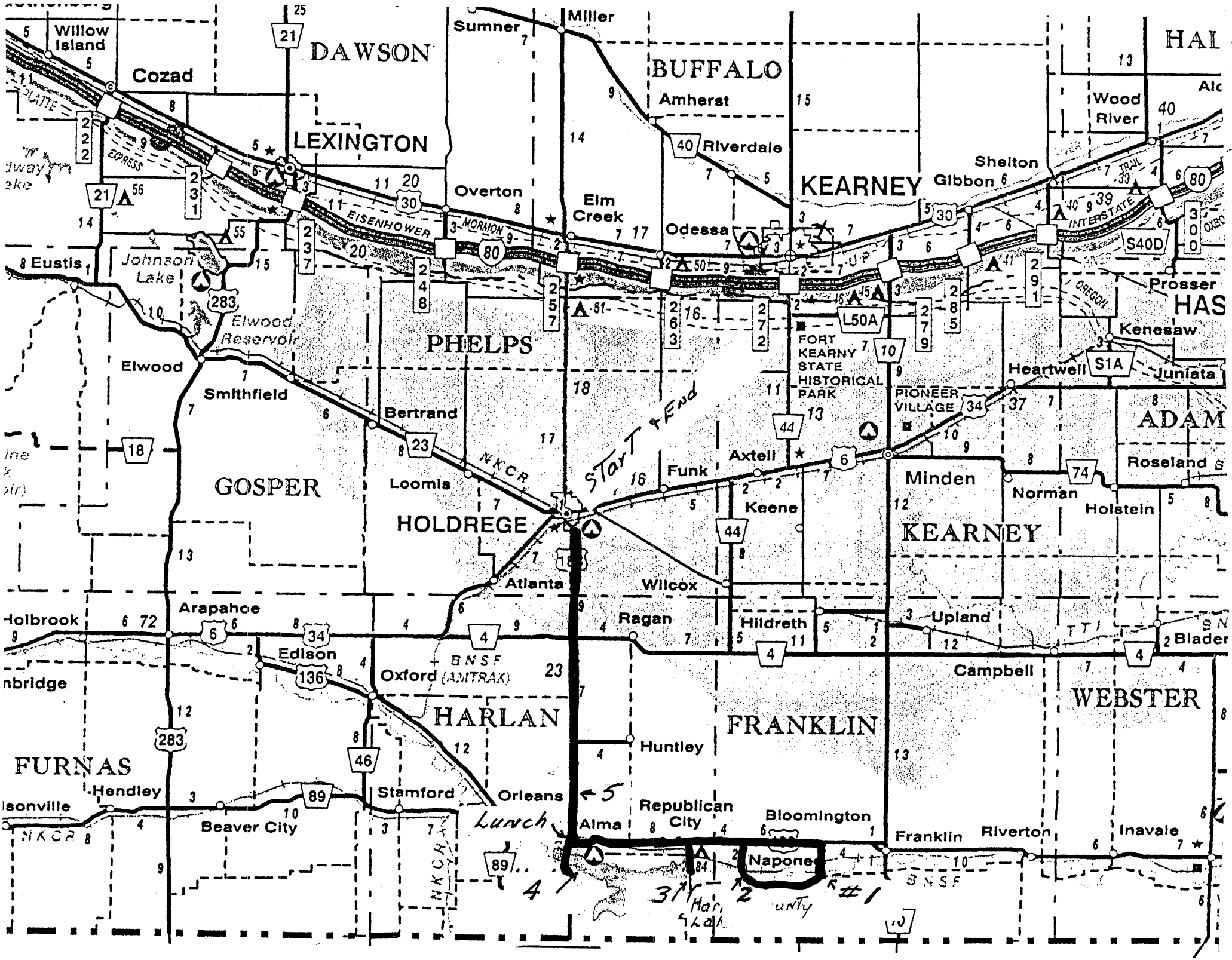
12:00 - 12:25 pm Drive to Alma for lunch at "The Depot". Talk on the status of Republican River Compact negotiations by Russ Oakland, Nebraska Dept Water Resources. Depart at 1:35 pm.

1:35 - 1:50 pm Drive to Harlan County Dam. View a Video and tour the Dam led by Corps of Engineers - Larry Janicek and Jim Brown, 1:50 - 2:50. Depart at 2:50 pm.

2:50 - 3:10 pm Drive to Pierre Shale and Niobrara Chalkrock outcrop south of Alma. Visit about the geology at the site. Roger Pabian & Jim Goeke. Depart at 3:40 pm.

3:40 - 3:50 pm Drive to the Alma water level observation well. Visit about the water level history. Bryan Lubeck, Lower Republican NRD. Depart at 4:20 pm.

4:20 - 4:50 pm Drive to CNPPID Offices in Holdrege for a talk on water level rises in the area by Don Schepler. Depart at 5:25 pm., and return to Tri-Basin Offices at 5:30 pm.


DAWSON
BUFFALO
LEXINGTON
KEARNEY
PHELPS
GOSPER
HOLDREGE
HARLAN
FRANKLIN
WEBSTER
FURNAS
ADAM
HAS
Willow Island
Cozad
Sumner
Miller
Amherst
Riverdale
Wood River
Shelton
Gibbon
Overton
Elm Creek
Odessa
Eustis
Johnson Lake
Elwood Reservoir
Elwood
Smithfield
Bertrand
Loomis
Axtell
Funk
Keene
Minden
Norman
Holstein
Roseland
Prosser
Kenesaw
Heartwell
Juniata
Fort Kearny State Historical Park
Pioneer Village
Start & End
Atlanta
Wilcox
Ragan
Hildreth
Upland
Campbell
Blader
Holbrook
Arapahoe
Edison
Oxford (AMTRAK)
Huntley
Republican City
Bloomington
Franklin
Riverton
Inavale
Naponee
Alma
Orleans
Stamford
Hendley
Beaver City
Lunch
Eisenhower
Mormon
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Oregon
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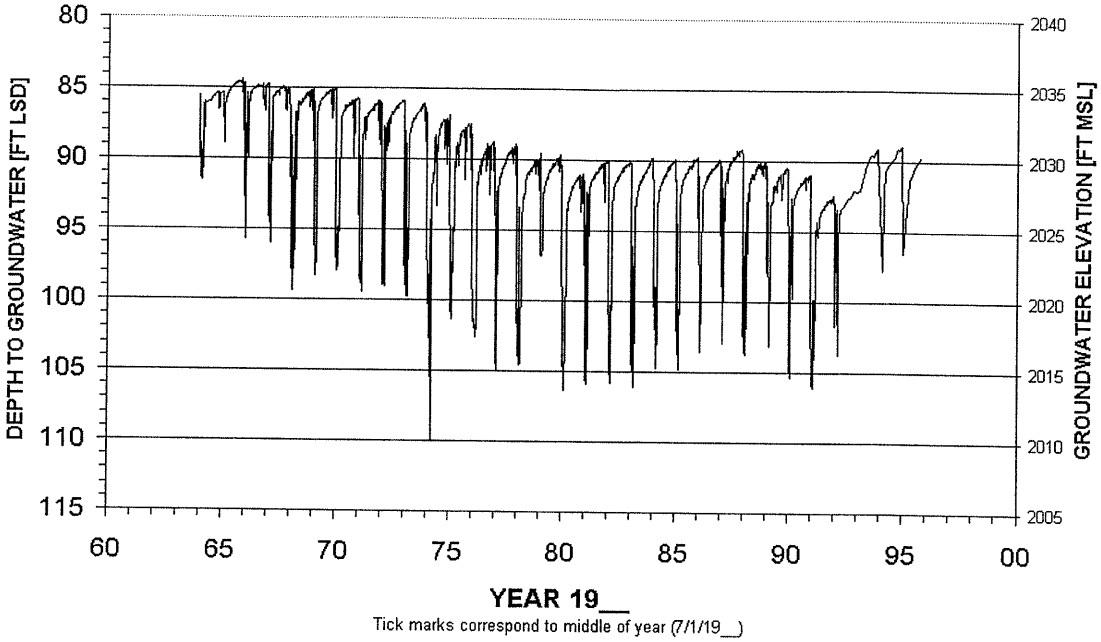
HARLAN COUNTY: ALMA RECORDER WELL
2N-18W-9BCC



Alma Recorder Well Data

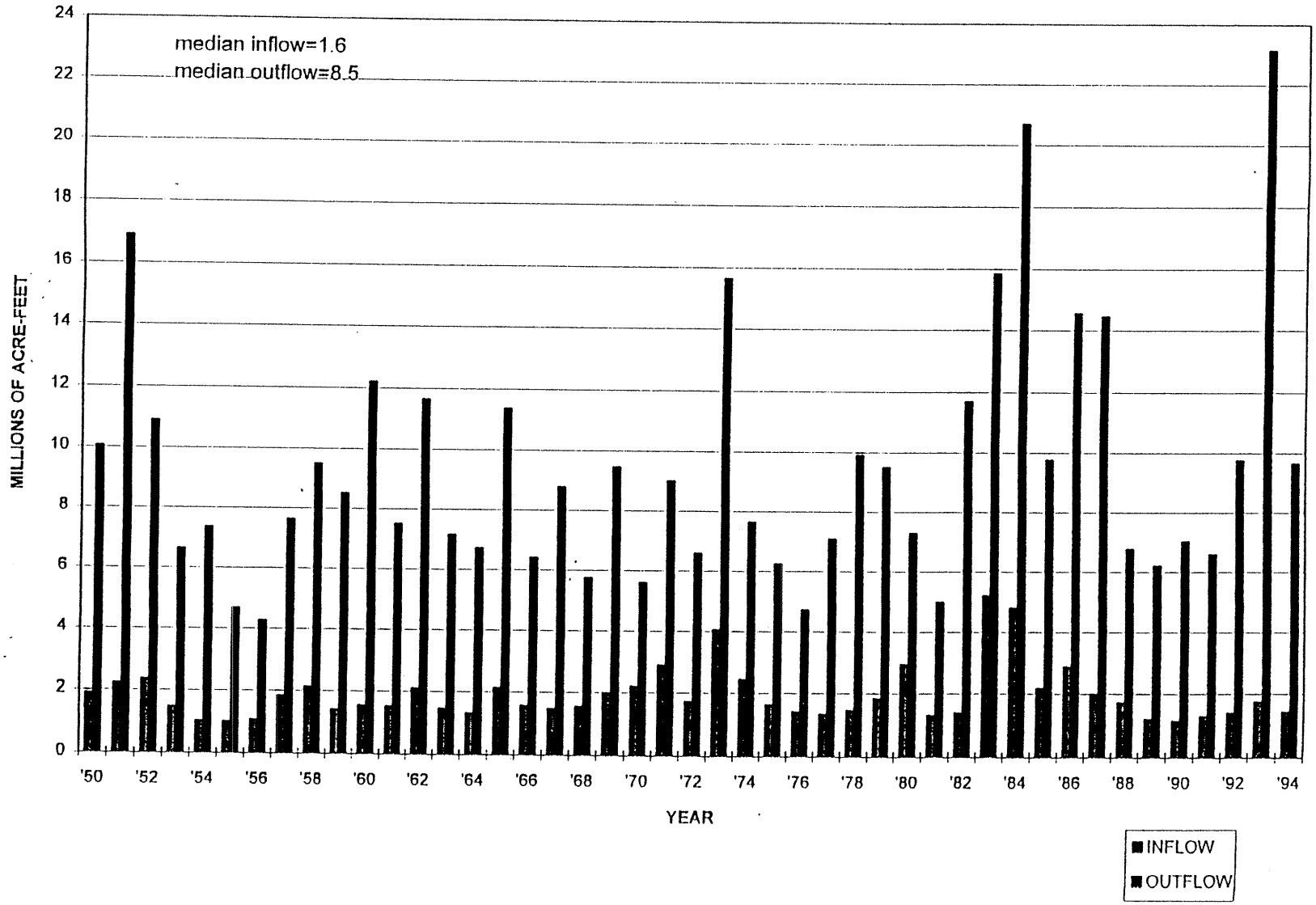
Location: 3.5 mi north of the junction of Route 3 and U.S. Highway 183 in Alma.
Depth: 170 ft.
Diameter: 6 in.
Aquifer: Sand and gravel overlain by fine-textured sediment (undifferentiated Pleistocene deposits).
Water occurrence: Confined.
Estimated predevelopment water level: 85 ft.
Development near well: Irrigation wells; earliest in 1945, rapid development in 1962-67 and 1971 to present.

Because groundwater in the vicinity of this well is confined, large and sharp water-level responses are caused by pumping from nearby irrigation wells.

A decline in hydrostatic pressure within the aquifer at this well's location is apparent from the fairly gradual lowering of year-end and spring high water levels since 1965. The net decline in 1974 was much larger than in any year of record. This reflects the below-normal precipitation during 1974. Little recharge reached the aquifer and heavy pumping was required to maintain soil moisture.

Water-level data are collected by the Lower Republican NRD and the USGS.

ANNUAL INFLOW OF WATER TO NEBRASKA AND ANNUAL OUTFLOW OF WATER FROM NEBRASKA 1950-1994



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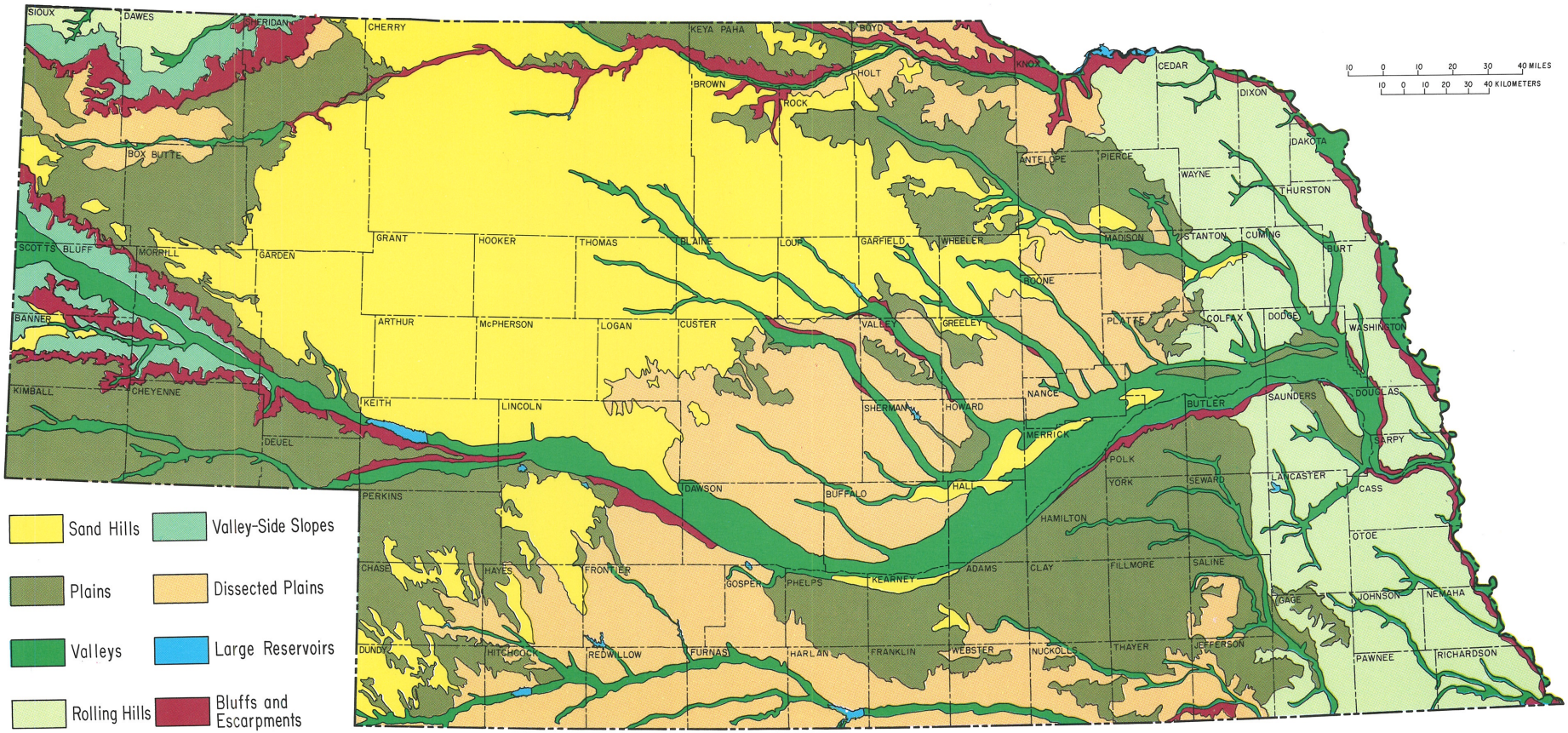

Valleys: flat-lying land along the major streams. The materials of the valleys are stream-deposited silt, clay, sand and gravel. **Valley-side Slopes:** moderately sloping land that occurs between the escarpments and the major stream valleys in western Nebraska. These areas are mostly siltstone bedrock covered by a few feet to a few tens of feet of sand, gravel or silt. **Large Reservoirs:** constructed for purposes such as water storage for irrigation, generation of electricity, flood control or recreation. **Plains:** flat-lying land that lies above the valley. The materials of the Plains are sandstone or stream-deposited silt, clay, sand and gravel overlain by wind-deposited silt (called *loess*). **Dissected Plains:** hilly land with moderate to steep slopes, sharp ridge crests and remnants of the old, nearly level plain. These are old plains eroded by water and wind. **Sand Hills:** hilly land composed of low to high dunes of sand stabilized by a grass cover. The sand dunes mantle stream-deposited silt, sand and gravel and sandstone. **Rolling Hills:** hilly land with moderate to steep slopes and rounded ridge crests. In eastern Nebraska, the Rolling Hills are mostly glacial till that has been eroded and mantled by loess, while in northwestern Nebraska the hills were provided by the erosion of clay and clay-shale beds. **Bluffs and Escarpments:** rugged land with very steep and irregular slopes. Bedrock materials, such as sandstone, shale and limestone, are often exposed in these areas.

Topographic regions map of Nebraska

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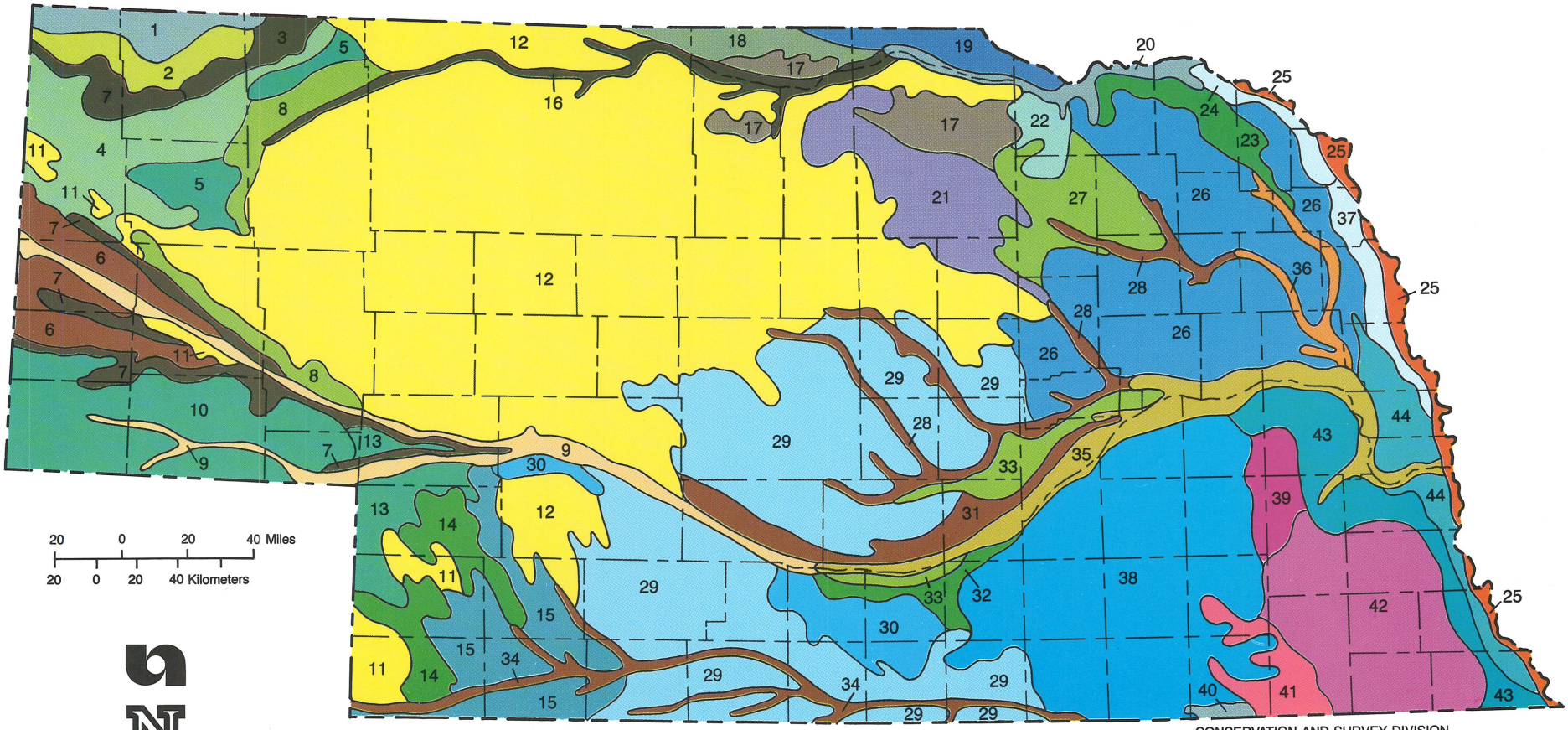
GENERAL SOIL MAP OF NEBRASKA



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
JAMES R. CULVER - STATE SOIL SCIENTIST
STEVEN J. SCHAEFER - CARTOGRAPHER
JANUARY 1988

CONSERVATION AND SURVEY DIVISION
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF NEBRASKA–LINCOLN
MARK S. KUZILA - RESEARCH SOIL SCIENTIST
ANN M. MACK - CARTOGRAPHER

1 - Pierre-Samsil-Kyle
2 - Kadoka-Mitchell-Bufton
3 - Canyon-Bridget-Rock outcrop
4 - Busher-Jayem-Tassel
5 - Keith-Alliance-Rosebud
6 - Tripp-Mitchell-Alice
7 - Tassel-Busher-Rock outcrop
8 - Jayem-Sarben-Valent
9 - Las-Gothenburg-Platte
10 - Rosebud-Alliance-Canyon
11 - Valent
12 - Valentine-Elsmere-Tryon
13 - Kuma-Rosebud-Satanta
14 - Satanta-Keith
15 - Kuma-Keith-Colby
16 - Tassel-McKelvie-Rock outcrop
17 - Jansen-O'Neill-Meadin
18 - Valentine-Duda-Tassel
19 - Onita-Reliance-Labu
20 - Labu-Bristow-Redstoe
21 - Els-Valentine-Loup
22 - Brunswick-Paka-Simeon
23 - Moody-Thurman
24 - Crofton-Alcester-Nora
25 - Albaton-Haynie-Sarpy
26 - Nora-Moody-Crofton
27 - Thurman-Boelus-Nora
28 - Hord-Boel-Inavale
29 - Coly-Uly-Holdrege
30 - Holdrege
31 - Cozad-Hord
32 - Kenesaw-Hersh
33 - Hersh-Valentine
34 - Hord-McCook-Hobbs
35 - Gibbon-Gothenburg-Platte
36 - Shell-Muir-Colo
37 - Ida-Monona
38 - Hastings-Crete-Fillmore
39 - Sharpsburg-Pawnee-Steinauer
40 - Kipson-Benfield-Crete
41 - Crete-Mayberry
42 - Wymore-Pawnee
43 - Sharpsburg
44 - Marshall-Ponca

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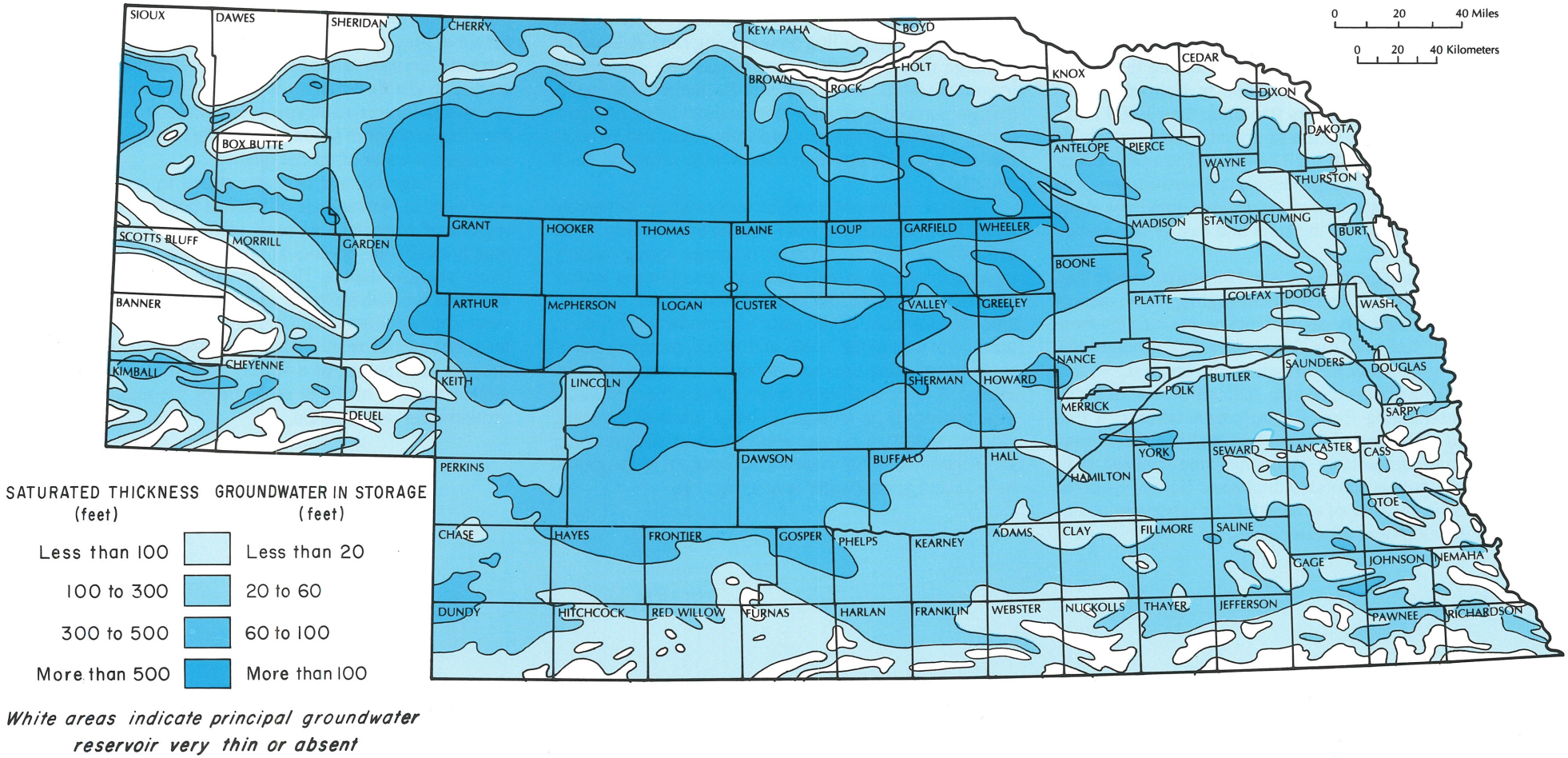

Saturated Thickness of the Principal Groundwater Reservoir

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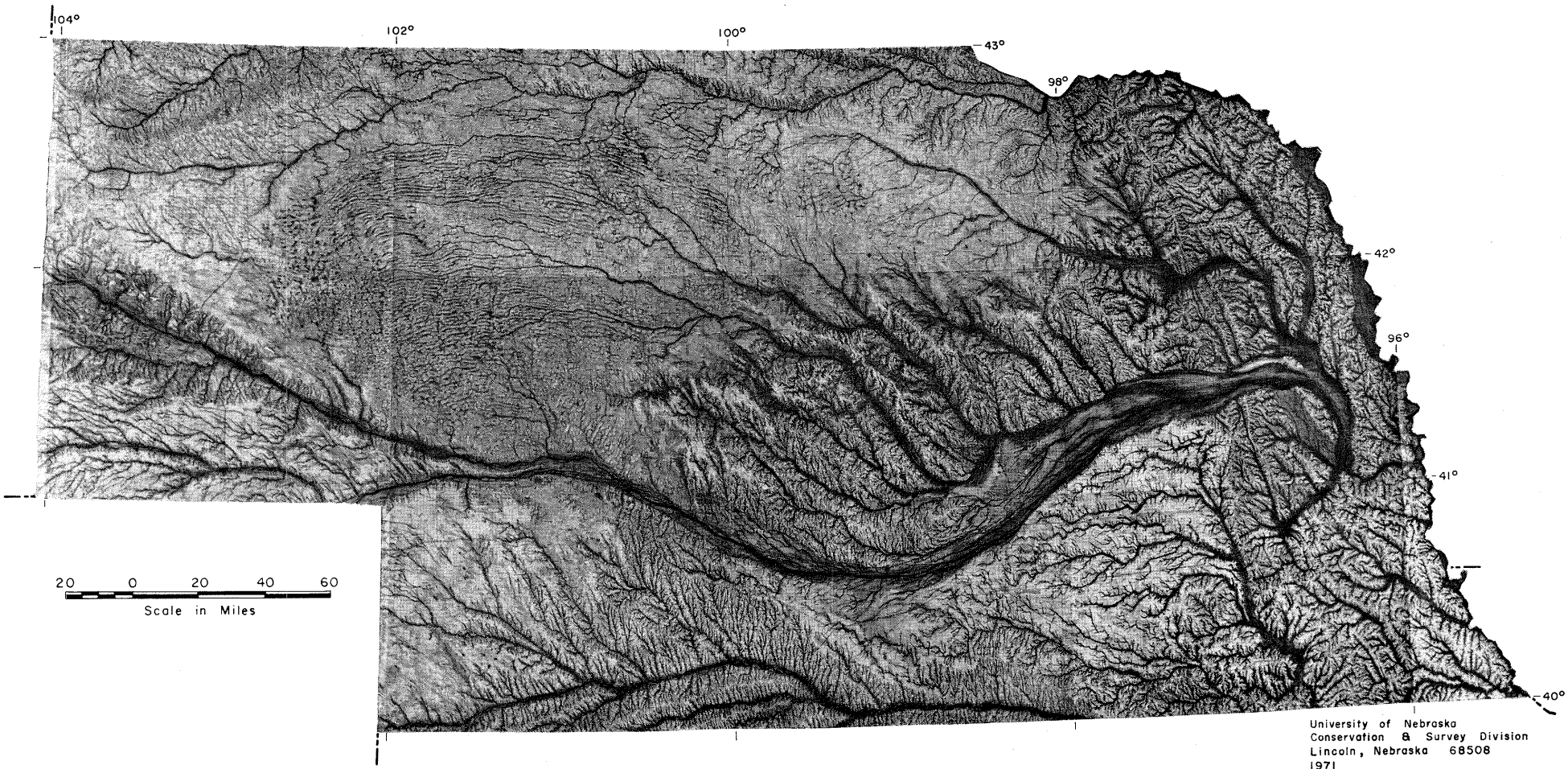
SHADED TOPOGRAPHIC MAP OF NEBRASKA



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1971

NOTE: Photographically reduced from the 1:250,000 U.S.G.S. topographic maps of Nebraska